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SOVIET MACHINE BUILDING

No. 29

SELECTED TRANSLATIONS

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Introduction

This is a serial publication containing selected translations of articles on the machine building industry in the Soviet Union. This report consists of translations on subjects listed in the table of contents below.

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1. From Demonstration to Introduction

Following is the translation of an article by V. Pospelov entitled "Ot Pokaza -- k Vnedreniyu" (English version above) in Promyshlennno-Ekonomicheskaya Gazeta (Industrial and Economic Gazette), 14 February 1960, page 4.7

...The Machine Building Pavilion. Beneath its enormous glass dome, among the various exhibited machines is a somewhat unusual one: a table with a tilted top. It resembles an extra-large schoolroom desk with incisions into which are inserted dozens of miniature models of standardized machine-tool units.

Evidently, this is an interesting exhibit -- it is surrounded by a dense ring of people. Some of them take a seat behind the table and use the models of standardized units, as if they were parts of a child's "erector" set, to "fit together" a new group machine tool. But this is by no means a child's game.

This table is a mock-up on which designers conduct responsible work -- the preliminary composing of a future machine tool. Machines which will have to be executed subsequently in nature of real parts, look, when put together on the mock-up table, much simpler and more accessible than on diagrams and blueprints. Such mock-up modeling makes it possible to visualize graphically the future machine and to determine an improved version of the machine.

The spectators around the table are participants in the 15-day seminar on the assembling, finishing and operation of group machine tools and of automatic lines from standardized units. Over fifty fitters and mechanics from the plants of the Moscow Sovnarkhoz have gathered here at the Exposition in order to familiarize themselves with new equipment and acquire practical habits in its assembling and finishing.

On having familiarized themselves with the assembling of equipment on the mock-up table the participants of the Seminar passed on to real-life machine tools. Various standardized units and machine tools assembled from these units are shown at the Exposition, and so is an actual automatic line for machining compressor vanes.

The standardized units can be used by the enterprises to design with their own resources various types

of equipment within a very short period of time. Moreover, such equipment is "flexible" and thus not difficult to adapt to the changing requirements of production. Machine tools assembled from standardized units can be easily re-assembled and converted into new types within 10-15 days.

The seminar instructor -- head of the Division of Industrial Introduction at the Scientific Research Institute of Technology and Organization of Production, Engineer S. Surin -- described in detail this new technique as a progressive trend in machine building.

After theoretical sessions, viewing of motion pictures, and general familiarization with the exhibits of machine tools assembled from standardized units, the Seminar's participants commenced practical work. A wide collection of diverse subassemblies, power heads and other standardized units was displayed at the Exposition. And this rich arsenal of new technology was, for the first time at the VDNKh Exposition of Achievements of the National Economy, utilized not only for display but also for practical Seminar sessions.

The engineers and fitters of the above-named Institute had, jointly with the Seminar's participants, dismantled and reassembled the most widely used of the standardized units, learned the art of troubleshooting, and investigated the special design and assembly features of the assemblable machine tools. Representatives of the Minsk and Khar'kov plants manufacturing equipment based on standardized units, described in detail the production of these plants to the Seminar's participants.

Subsequently, the Seminar's participants familiarized themselves with machine tools and automatic lines in actual operation. Tours of Moscow plants were conducted. In these plants -- imeni Ordzhonikidze, imeni Likhachev, and the Small-Displacement Car Plant -- specialists demonstrated to the touring participants the operation of group machine tools and automatic lines.

We talked to many of the Seminar's participants. They noted that the knowledge acquired at the Exposition is very useful in practical work. But all fitters-adjusters and mechanics expressed the wish of acquiring more practical habits. Therefore, it is expected that the second course of the Seminar will be conducted directly in the plants in which group machine tools and automatic lines will be installed. The Institute has dispatched to such plants fitters having considerable experience in assembling and finishing. They will assist the Seminar's participants in independent practical work.

"If you need advice or consultation," declared

Engineer S. Surin at the final session of the Seminar, "have no compunction about turning to us at the institute. We will be glad to provide you with any technical assistance."

"Last year," recollects Engineer S. Surin, "the collective of our Institute, having accumulated substantial experience in the designing and construction of automatic lines and group machine tools on the basis of standardized units, resolved to furnish creative assistance to ten Moscow enterprises in the construction of 15 lines and 67 group machine tools. Our initiative was approved and supported by the Moscow City Sovnarkhoz."

"The Institute assigned a team of leading designers for heading the designer crews of the plants. Under the direction of experienced specialists and plant design bureaus 15 automatic lines and 62 group machine tools have already been designed. Our promise was made good."

Engineer S. Surin informed the Seminar's participants about the future plans. This year the collective of the Institute decided to conduct refresher courses for designers in several of the country's sovnarkhozes in which equipment will be produced from standardized units. These courses will be conducted in the form of a series of lessons to be followed by consultative assistance in the composition and design of equipment according to the concrete technical tasks of the plants.

The conducted Seminar has laid the foundation for creative collaboration between the specialists of the Institute and industrialists. And to the VDNEh the Seminar was the beginning of the search for such new forms of activity as would assist in ensuring a rapid industrial introduction of technological innovation.

One of the organizers of the Fitter's Seminar, Senior Methods Engineer of the "Machine Building" Pavilion G. Leyzerin, spoke of the need for continuing and developing this so successfully started activity. The Exposition could, in the not distant future, be the site of a conference of designers concerned with the designing of machine tools and automatic lines from standardized units, and of short-term training courses for fitters-instructors to be dispatched back to various cities of the Soviet Union. On acquiring knowledge and experience at the Exposition, they will transmit it to their plants.

On the Photo: Engineer S. Surin familiarizes the Seminar's participants with the ASFEN-600 group machine tool designed by the Scientific Research Institute of Technology and Organization of Production.

2. Why Can't We Finish This Unique Machine

Following is the translation of an article by A. Serbayev, A. Mel'nikov, and Ya. Asmanov entitled "Pochemu My ne Mozhem Sdat' Unikal'nyy Stanok" (English version above) in Pravda, 10 April 1960, page 3.

We, the fitters-assemblers at the Gor'ki Milling Machine Plant, find it necessary to inform the public about the following fact.

Our brigade is assembling the "6682" type unique milling machine. The weight of this machine is 330 tons and the cycle of its assembling lasts two and one-half to three months. According to the plan it should have been readied as early as 1959, but now eight more months have passed and the machine still remains in the shop, where it occupies over 300 square meters of production space. In such a space our brigade could have assembled not less than ten special medium-sized machine tools during that period.

We have frequently appealed to the plant's administration, but it is unable to do anything: the machine cannot be completed and released because of the lack of a single part whose delivery has been delayed by the Kolomna Plant for about half a year now. That part is called "Table 6682-706."

It seems to us that the heads of the Moscow Oblast Sovnarkhoz and Kolomna Plant have forgotten their obligations to the Gor'ki machine tool builders. We request the "Pravda" to remind them of this.

Attached is a photograph of the machine, which we cannot complete because of the Kolomna men's delay.

3. Striking Changes

Following is the translation of an article entitled "Razitel'nyye Peremeny" (English version above) in Kommunist, 14 February 1960, Yerevan, page 4.7

In the days of the 21st Congress of the Communist Party of Armenia the Sovnarkhoz organized an exposition of the republic's industrial output produced in the last two years. This is a small but instructive exposition. It graphically demonstrates the rapid development of our industry and rise in its technological level, the towering skill of workers, engineers and technicians, and the ceaseless and fertile researches of scientists.

Machine tool builders could show to the delegates to the 21st Party Congress only two of their products -- a screw-cutting lathe and a vertical-drilling machine, which were both of obsolete design to boot, although at present Armenia's plants have mastered the production of a fair dozen of modern and beautiful machine tool types. Outstanding among these types is the horizontal-boring machine manufactured by the young Lusevenskiy Plant, which can be used to conduct seven different operations with an accuracy of up to one micron.

Next best are the latest-model universal circular-grinding and milling machines manufactured by the new Yerevan and Leninakan Plants which opened in the first year of the Seven-Year Plan.

The drilling and threading bench machines of the Kirovskanskiy Precision Machine Tool Plant are of an original design. They are designed for machining the miniature parts used in the watchmaking and instrument building industry.

So as not to lag behind the needs of technological progress, it became necessary for our "oldsters" -- the Dzerzhinskiy and Oktember'yanskiy machine tool plants -- to modernize their production and to master the manufacture of new high-precision machine tools.

The machine tool industry of the republic is advancing with seven-mile strides. In the last two years machine tool output has increased by 56.8 percent, and at the end of the seven-year period it will increase 11 times.

Our machine builders also have a reason to be proud. The Compressor Plant has demonstrated new economical and highly productive VU-6/8 and VU-3/8a air compressors. Of

interest is the first experimental model of a diesel-compressor with freely moving pistons designed by the Armenian Branch of the Scientific Research Institute of Electromechanics. This machine has a great future.

After serious criticism, the Leninakanskiy Forging-Pressing Equipment Plant had radically altered the outer appearance of its products. It abandoned the cumbersome and lowly productive presses and switched to the production of more economical presses.

Recently the "firstling" of the seven-year period, the "Gidroprivod" Hydraulic Drive Plant in Yerevan has placed on the All-Union market its new products -- hydraulic panels and valves. At present it is mastering the production of a more complicated machine -- a radial-piston pump whose model was displayed at the Exposition.

Only a few months have passed since the birth of the Yerevan Tool Plant, but it has been persistent and successful in obtaining space for exhibits at the Exposition and it has exhibited the "Yerevan" gas range and general-purpose assemblable attachments for the mechanical machining of parts. But this does not limit the variety of machine building output. Also displayed were new models of children's bicycles, single-unit hydraulic presses, automobile spare parts, fittings for the chemical industry, standardized machine tool parts, and other products....

4. Obsolete Machines Are Being Replaced

Following is the translation of an article entitled "Ustarevshiy Mashiny Zamenyayutsya" (English version above) in Promyshlennno-Ekonomicheskaya Gazeta (Industrial and Economic Gazette), Moscow, 21 February 1960, page 3.7

NOVOSIBIRSK (TASS). The first lot of the new model 1M-9t combined machine tools developed and industrially introduced by the Plant imeni 16th Party Congress as replacements for the previously manufactured 1A-95, has been received. The new machines can machine large-sized parts, cut thread of any form without special retooling, and conduct milling, planing, grinding, and drilling operations. The subassemblies of the machine are so arranged that the access to them is easy and convenient. It is possible to machine simultaneously two parts on a 1M-95 machine: drill one, turn the other, and so forth.

The Plant imeni 16th Party Congress proceeds according to the plan with its replacement of old types of production by new ones developed, incidentally, by the plant's designers. In particular, a large number of semi-automatic lathes currently manufactured by that plant will be replaced by the production of automatic lathes. In the next few months the production of the obsolete model MK-22 and MK-44 machines will be discontinued and replaced by the production of newer models with a broader range of speeds and broader ranges of machining rates. Their productivity is 15-20 percent higher than that of the old ones. Here the increase in productivity was achieved without changing the dimensions and weight of the machines. In 1961-1962 it will be necessary to replace by new models, or to modernize, all of the products manufactured by that plant, without exception.

At another Novosibirsk plant -- "Trud" -- this year about a third of output will consist of new or modernized mining machines, replacing the ones which have become obsolete, and within the next three or four years all of the products of that plant without exception will be renovated. The production of obsolete electrical machines at the Turbogenerator Plant is being discontinued and replaced by the production of new ones, and the same fate is happening to machine tools and presses at the Plant imeni Yefremov, soil implements at the "Sibsel'mash" Plant, etc.

Plans exist for discontinuing the manufacture of 137 products and modernizing the manufacture of 90 products within the next few years.

5. On Machine Tools, Tools, and Attachments
(Notes of a Gear-Cutting Worker)

Following is the translation of an article by N. Petrov entitled "O Stankakh, Instrumente i Prispособleniyakh -- Zametki Zurorezchika" (English version above) in Promyshlennno-Ekonomicheskaya Gazeta (Industrial and Economic Gazette), 2 March 1960, Moscow, page 2.⁷

All textbooks on gear cutting describe in detail the advantages of cutting worm-gear pinions by the axial feed method. Nonetheless this method has been rarely introduced in our machine building plants. Why? The principal reason is the imperfection of the equipment used.

The machine tools of certain German and Czechoslovak firms have an original combined tool carrier by means of which it is possible to cut cylindrical gears of any type. And it is very shameful that at present one of our best plants -- the "Komsomolets" in Yegor'yevsk -- still continues to manufacture gear-cutting machines with two tool carriers. One of these carriers -- the main one -- serves to cut cylindrical gears with straight and oblique teeth and worm gears by the radial feed method, and the other -- special -- serves to cut worm gears by the axial feed method.

Such a cumbersome design causes much trouble for the machine tool operator. To adjust the machine to operation by the axial feed method it is necessary to remove one tool carrier and insert the other. This is a complicated business, and usually the operator needs the help of a fitter in this. On the 5D32 gear-cutting machine, e. g., the replacement of tool carrier does not take less than an hour, whereas on the Czechoslovak models with a combined tool carrier the time of readjustment is virtually nil. This is why even such a large industrial center as Kiev lacks even one machine building plant practicing the cutting of worm gears by the axial feed method.

The technological advantages of the cutting of gears by the axial feed method are widely discussed in the specialized literature. Here one would like especially to touch upon the economic expediency of this method.

As is known, the diameter of the base circle of the hobbing cutter designed for cutting worm-gear pinions should correspond to the diameter of the base circle of the worm which will work in a mesh with the pinion. A

violation of this requirement inevitably results in a defective product, and in a premature wear of the worm gears. The hobbing cutter used in this operation is a special one, as it is suitable only for cutting the teeth of a specific worm-gear pinion, i. e., a different hobbing cutter is needed for every type of pinion. This is, of course, not very convenient. But if the axial-feed method is employed then a small form cutter insertable into a special holder could successfully replace the expensive special hobbing cutter.

Unfortunately, the experimental plant of the Institute of Electric Welding Imeni Paton, e. g., has ordered over an hundred expensive special hobbing cutters instead of a tangential combined tool carrier. Many other plants are doing likewise, and it is difficult even to calculate how much such extravagance is costing the State. This wastage is aggravated by another factor. When there are not enough special hobbing cutters in the enterprises, worm-gear pinions begin to be cut in just any manner: after all, the plan will not wait. This results in violating the precision of the dimensions of parts, in defective parts. And yet, had they used the combined tool carriers, the workers of the above-named experimental plant could have used twenty inexpensive form cutters in lieu of an hundred hobbing cutters, and thus they could have saved not less than 50,000 rubles.

Under the conditions of large-serial production when a single operation is repeated month after month, it makes sense to construct a special hob. In this case it is recommended to use the so-called combined method of cutting worm-gear pinions. The nature of that method consists fundamentally in that the precision method of axial feed is combined with the highly productive method of radial feed. The quality of the pinions cut in this manner is irreproachable in every sense.

The machine tool building enterprises manufacturing gear-cutting equipment, and especially the "Komsomolets" Plant in Yegor'yevsk, should perfect as soon as possible the design of the tangential tool carrier, and the tool builders should organize the production of form cutters in standard sizes for cutting the teeth of gear pinions in all modules.

In addition to receiving a complete set of standard arbors for hobbing cutters, the consumer plants should also receive two or three standard-sized arbors for form cutters for cutting worm-gear pinions by the axial feed method, and a set of form cutters.

I would be far from wrong in stating that 99 percent

of the hobbing cutters manufactured by our tool plants are designed for the right-hand approach, and only one percent, for the left-hand approach.

And yet, it is known that the direction of rotation of the carriage of a gear-cutting machine, and hence also of the worm index gear depends solely on the direction of the turns of the hobbing cutter: if a right-hand cutter is used, the carriage rotates counter-clockwise, and if a left-hand cutter is used -- clockwise. And inasmuch as 99 percent of the hobbing cutters with which we operate are right-hand, therefore the index worm gears of nearly every machine tool turn in a single direction only, wear out rapidly, and lose their precision prematurely. As for the opposite side of the tooth of the worm index gear, it remains fundamentally untouched.

And yet the worm index gear is the heart of the gear-cutting machine tool! In the machine shop of the "Komsomolets" Plant I saw an astonishingly clean room where a fixed temperature is maintained in summer and winter. In that room stands a single high-precision machine tool used exclusively for cutting the teeth of worm index gears for gear-cutting equipment. There, the finished gear pinions are subjected immediately to the most thorough and careful inspection by special instruments, and only the absolutely perfect ones are allowed to proceed to the assembling department.

Such are the ideal conditions under which worm index gears are manufactured. This means that the problem consists in maximally increasing the longevity and conserving the precision of these gears through a proper operation of equipment.

It remains only to be added that our technical literature, all our manuals, persistently recommend the observance of the following rule: the right-hand helical pinions should be cut by a right-hand hobbing cutter, and the left-hand pinions -- by a left-hand hobbing cutter. But, where then could the left-hand hobbing cutters themselves be found?

There used to be a time when even the large Soviet plants lacked a single indigenous, Soviet-produced gear-cutting machine tool and operated only with imported ones, mostly American. Now everything has changed: a tremendous number of indigenously produced gear-cutting machine tools operates in the country's plants. It is necessary for our foremen, technologists and designers to devote serious attention to the problems of the conservation and reasonable use of this expensive equipment.

* * *

The Soviet machine tool building industry has mastered the production of a large number of the most variegated and intricate machine tools for the cold working of metals. For the first time in the history of world-wide practice, the continuous-flow production of lathes and radial-drilling and milling machines has been established. And it is mortifying to admit that we have not as yet learned how to make good-quality accessories for these machines: rotary tables, machine vices, chucks, etc.

If a good tractor operator is given an excellent tractor provided with a poor plow, it can be predicted in advance that he will either fail his assignment or execute it very badly.

The same applies to a plant. It is definitely not enough to provide a milling machine operator with an excellent machine. In order to utilize maximally all the possibilities of the machine and to attain a high productivity and superb quality of the machining of parts, it is necessary to have on hand good-quality, precision vices and a satisfactory rotary table.

Unfortunately, this simple truth remains an enigma to certain heads of our planning organizations, who entrusted the production of machine tool accessories to the Plant in Baranovichy. The point is that that plant lacks skilled personnel and the necessary industrial-technical base. Over there they cannot as yet make a proper technological assessment of the nature of performance of these attachments, they cannot understand why is it that the vices and rotary table which proved so good for the custom machine shop or the brick plant are absolutely unsuitable for operation in the machine shop of a modern machine building plant.

So what is the result? Even the totally new rotary table manufactured by the Baranovichy Plant cannot be used to conduct such an elementary operation as the graduation of a circumference into equal parts, because the error exceeds the tolerance limits. And after two months of operation of that table the error grown to one millimeter! The worm gears are worn by such high-speed tempos and the resulting backlash is so considerable as to make the table virtually unfit for practical use.

The vices are cumbersome, and the poor fitting of individual parts during the clamping of a product always results in a skewed alignment. The clamping screw and nut, the illegible and the guides are all manufactured very shoddily and therefore get out of order quickly.

If we compare the rotary table and the vices which we receive from our Hungarian friends with those received

from the Baranovichy Plant, the difference becomes striking.

How much longer will we tolerate this?

The milling machines from Czechoslovakia or Hungary always arrive together with a complete set of all the necessary tool holders, index head, rotary table, vices, etc., while our own plants often deliver machine tools with only one or two tool holders.

A year ago the Gor'ki Milling Machine Plant delivered to the "Kievdomash" Kiev Road Machine Plant a remarkable latest-model milling machine and at the same time sent a letter stating that it would, if so desired by the purchaser plant, deliver separately and in return for an additional payment the index head, the rotary table with hand feed, vices, and a slotting attachment. A telegram was immediately dispatched to Gor'ki: yes, we want very much to purchase all these accessories. Thereupon, several more telegrams were sent and finally, only after two months, the Gor'ki Plant delivered... the index head only, saying that it could not send the other accessories.

Why are you prevaricating, comrades from Gor'ki?

The Saratov Heavy Gear-Cutting Machine Tool Plant announced in a circular enclosed in its shipments of gear-cutting equipment that if the user so desires, a special cabinet for storing all accessories will also be sent. But the user plants find out about this only after they have already received the machines. Or perhaps are the Saratovites thinking that an enterprise which has paid tens of thousands of rubles for a machine tool will refuse to add 200 more rubles for the necessary cabinet? And meanwhile the separate shipping of the cabinet is costing the State quite a lot.

All this is but another proof that machine building plants do not consider sufficiently the interest of the users. It is necessary to put an end to this situation, once and for all.

6. Machine Tools With Defects

Following is the translation of an article by G. Luk'yanova, I. Korotin, M. Rybakov, A. Kolomenskiy, A. Shavin, and N. Ushatkov entitled "Stanki s Defektami" (English version above) in Vechernaya Moskva (Evening Moscow), 21 March 1960, page 2.⁷

The Likhachev Automobile Plant is one of the 35 Moscow enterprises switching to over-all mechanization and automation. A great deal of work has to be accomplished. It is sufficient to mention that during the seven-year period the over-all length of conveyors [at that plant] will increase two and one-half times and reach 51 kilometers. The number of automatic lines will increase to 172 from the existing nine, during the same period. All this will make it possible to increase the output of trucks by not less than 70 percent.

The shops of this giant automobile plant are already being provided with improved equipment. Automatic lines and various machines and assemblies are being installed.

The plant's workers had every right to hope that purveyors will provide them with equipment of good quality. But so far this has not been the case. The machine tools received by the plant display many defects, poor fits, and shortcomings in execution.

The gearbox and engine shops should produce units of new models in the immediate future. For this purpose, their machine tool pool has had to be expanded. The "Krasnyy Proletariy" Plant supplied us with semi-automatic lathes for turning the heads of the primary shaft. The second and third saddles of these lathes were found to be unfit and had to be replaced. The model "1282" semi-automatic lathes sent by the same plant also proved to be defective.

All the machine tools received from the "Krasnyy Proletariy" Plant had arrived with uncovered main motors. Because of this, they will rapidly clog up with dirt and get out of order while in operation. The fastening fixtures were not heat-treated and break down when handled again.

The equipment provided by the Plant imeni Sergo Ordzhonikidze displays considerable defects. The group machine tool designed for counterboring apertures and face trimming was not provided with protective casings. As a

result, the emulsion splatters and floods electric drive and the electric terminals inside the machine. The hydraulic copying lathes for turning rings, sent by that plant, do not machine parts with the necessary precision. The special milling machine also produced by that plant contains four spindles that were built with deviations from the blueprints, and its supporting arms lack a grease cup.

Equipment with various defects was sent in by the Automatic Line and Kirov plants in Minsk, the Group Machine Tool and Grinding Machine plants in Khar'kov, the Sterlitamakskiy Plant imeni Lenin, and a number of other enterprises.

And the results are such: instead of assembling and activating the new equipment, the fitters in the engine and gearbox shops have to repair and modernize the incoming machine tools, i. e., to do what the machine tool builders should have done.

It is to be hoped that the Moscow City Sovnarkhoz will take measures to ensure that the equipment arriving at the Likhachev Automobile Plant satisfies technical requirements fully, is of high quality, and is provided with a complete set of accessories, so that the plant's automobile workers would not have to remedy the defects themselves. They have plenty to do anyway.

It should be stated that the quality of the abrasive tools received at the Plant imeni Likhachev does not satisfy the growing requirements and is becoming an obstacle to further technological progress.

For a number of years the plant has been petitioning the Gosplan and its principal purveyor -- the "Il'ich" Abrasive Tools Plant in Leningrad -- for improving the quality of these tools. But the status quo still remains. Forty percent of the grinding wheels received by the plant are defective in the sense of irregular strength and cutting properties. The low quality of abrasive tools hampers the mass introduction of high-speed methods of machining.

The abrasives plants refuse orders for tools of monocrundum or vanadium steel. The quality of the rolls of fabric-based emery cloth is deteriorating year after year. All these abnormalities compel the Plant imeni Likhachev to maintain an excessively large staff of quality control inspectors, because all of the abrasive tools we receive have to be inspected for quality.

7. A New Automated Machine Tool is Shipped
to Chelyabinsk

Following is the translation of an article written by D. Greyn entitled "Novyy Avtomatizirovanny Stanok Otgruzhen v Chelyabinsk" (English version above) in Zarya Vostoka (Lawn in the East), Tbilisi, 15 March 1960, page 2.7

The workers and specialists of the Tbilisi Machine Tool Building Plant imeni S. M. Kirov have completed the construction of the first 2K73 four-spindle automatic tube-cutting machine. Today it is already on the way to its destination -- a plant in Chelyabinsk.

The purpose of the machine is to undercut the edges of water-supply pipes. The pipes are long -- from eight to 10 meters.

Not one but four pipes can be handled at a time, and moreover the machining is of the continuous-action kind.

8. Progressive Methods in Machine Building

Following is the translation of an article by I. Sochinskiy entitled "Progressivnyye Methody v Mashinostroyeniye" (English version above) in Kommunist, Yerevan, 9 April 1960, page 2.7

The June Plenum of the CC CPSU outlined the paths of further technological progress in industry, based on the over-all automation and mechanization of production processes, replacement and modernization of obsolete equipment, and introduction of progressive high-productivity technology. A major role in solving these tasks is assigned to machine building. As is known, contemporary machine building consists of three technological processes: production of part blanks, machining of these blanks, and assembling of machines.

The process of the machining of parts by cutting is the most labor-consuming one and it accounts for 50-70 percent of the total labor expenditures. It requires a large number of complex and expensive machine tools, and highly skilled personnel of workers, technicians and engineers. As a result, it costs the machine building enterprises approximately six or seven thousand rubles to do a volume of machining equivalent to one ton of shavings.

In our [Armenian SSR] republic the metal-machining enterprises add as much as five thousand tons of shavings annually to metal scrap. Assuming that in the next few years the volume of shavings will grow to 10,000 tons, this will cost the republic's machine building industry 60,000-70,000 rubles irretrievable losses a year. The reduction of these losses through the introduction of new, progressive methods of the machining of machine parts will yield enormous savings of funds to the State.

A majority of the republic's machine building plants -- both the ones under modernization and the ones under construction -- do not provide in their projects for even a 50-percent conversion of the technology of the metal-cutting machining to up-to-date methods. The plastic working of metals, as the most efficient and productive method, should find broad application in the republic's machine building industry. Because of the lack of appropriate capacities in forging-pressing shops, the bulk of the metal is utilized inefficiently, without plastic working, thus resulting in a large amount of wastes (shavings

and chips). Only 15-20 percent of the metal consumed in the republic is utilized in the form of drop forgings.

Armenia's machine building will make a stride forward during the seven-year period in the transition to new technological modes of metal working. All machine tool and bicycle plants are planning to introduce the production of parts by pressing metal powders and the plastic working of toothed gears by hot and cold knurling. Plans exist for the construction of a forging-pressing shop at the Automobile Spare Parts Plant. There all the fabricated spare parts for trucks and passenger automobiles will be pressure shaped, i. e., drop forged.

The casting shops being built in Lusavan at the local Tools Plant and at the Leninakah Grinding Machines Plant will be provided with special equipment for die casting and precision casting. The products obtained by these methods display a high precision and do not require subsequent machining.

The introduction of the method of investment-shell mold casting elevates the general level of production, cuts the percentage of rejects, and steeply raises labor productivity in all foundry processes. At the same time this reduces the machining needs by 50-60 percent.

Another progressive method of contemporary machine building is the electro-slag welding, developed at the Institute of Electric Welding imeni Paton. The use of that method will increase greatly labor productivity and yield substantial savings of metal. This method can replace casting and forging, and free production space and a great deal of equipment. Methods of drop forging are incomparably superior to flat-die forging, and they considerably increase labor productivity and reduce the needs for subsequent machining by cutting.

A special place among the progressive methods of metal working is occupied by knurling and helical rolling. The manufacture of toothed gears by the method of the hot knurling of teeth will increase labor productivity dozens of times, free a considerable amount of expensive gear-cutting equipment, reduce the losses of metal in shavings, and cut the expenditures on tool production.

Thus, a broad introduction of the progressive methods of the working of parts assures the possibility for a gradual conversion of the production process of machine building from three technological stages to two.

For this purpose, plans exist for building at the Lusavanskiy Tool Plant a forging-pressing shop with a capacity of several thousand tons of forgings a year.

The first battery of the "Stankonormal'" Plant has

been activated; the output of that plant will fully satisfy the needs of the republic's entire machine building industry for machine-tool patterns and fastening fixtures. As is known, dies are the basis for the plastic working of metals. The problem of their production is being solved by reconstructing the former Yerevan Metal Products Plant and Tools Plant.

The establishment of specialized production of patterns, fastening fixtures, castings, forging-pressing equipment, and tools, in the republic will free in many plants considerable production space and equipment which can be utilized for producing more machines and machine tools without additional capital investments.

In connection with the new tasks ensuing from the Resolution of the June Plenum of the CC CPSU, it is impossible to regard as normal the fact that the republic's machine building industry operates with a very small number of specialists in the working of metal by progressive methods. The Polytechnic Institute should improve the training of metallurgical engineers in the hot working of metals. To increase appreciably the output of machine tools in the plants of the republic and to introduce new technological processes, it is necessary to develop the specialized production of tool equipment -- metal patterns, press-molds, dies, machining attachments, and subassemblies.

The tasks stipulated by the 21st CPSU Congress with regard to automation and over-all mechanization of production should be solved primarily by machine builders. They are called upon continually to modernize and perfect the manufactured machines, machine tools, and diverse mechanisms, and to reduce maximally the periods of the mastering of the industrial production of new models.

As is known, the period of the mastering of the production of new machines in enterprises lasts many months and sometimes even years. As a rule, over one-half of labor expenditures here goes for the preparation of production -- the designing and construction of the production equipment. Thus, the production of the 1L61 machine tool at the Plant imeni Dzerzhinskiy required over 600 special attachments. The designing of one of these attachments took at least 10-12 hours of work by a designer, and their construction took an average of 50-60 quota-hours of work by skilled toolmakers and 40-50 kg of tool and structural steel per attachment. Every such attachment cost the plant 1,600-2,000 rubles, and the total sum of the related expenditures amounted to 1,500,000 rubles.

A like situation exists in the other machine tool enterprises of the republic. The construction of the equipment for the manufacture of new products costs 10-12 million rubles annually for the Machine and Machine-Tool Building Administration of the Sovnarkhoz as a whole. But any special attachment becomes unnecessary and consignable to the scrap heap the moment a plant switches to the production of another, newer machine or machine tool.

Is it then possible to shorten the period of preparation for the production of new machines or machine tools, to cut the expenditures on the construction of the related production equipment.

Engineers and designers in Leningrad and Moscow have designed universal-assembling attachments ("USP"), whose nature consists in that the necessary attachments for machine tools and control instruments as well can be assembled within a few hours from standard (normalized) parts. And when the need of this or that attachment ceases to exist -- it is dismantled. But its parts are subsequently used for assembling new attachments. The parts of such universal-assembling attachments can serve many years until they wear out.

Calculations show that the construction of 15 complete sets of universal-assembling attachments, which will cost six million rubles, i. e., 350,000-400,000 rubles per set, will result in saving 10 million rubles annually in 15 plants, not to mention the colossal effect of the reduction of the periods of the mastering of the production of new machines and machine tools, the great savings in tool and structural steel, the relieving of a considerable number of highly skilled designers, toolmakers, draftsmen, etc.

Considering the great effectiveness of universal-assembling attachments, the Sovnarkhoz of the Armenian SSR is reconstructing, on the basis of the former Metal Products Plant, the Yerevan Tool Plant for the production of progressive technological production equipment.

In 1960 a total of 3,000 type-names of universal-assembling attachments was incorporated into the production plan /of the Yerevan Tools Plant/. The Leningrad tools plants are training 50 toolmakers from Yerevan. Certain of these have returned and started the production of the "USP." However, the heads of the plant underestimate as yet the importance of the "USP," although these attachments are awaited by many of the republic's machine building enterprises. The plant still has not a completely operative design and technology bureau.

The Special Design and Technology Bureau under the

Machine and Machine-Tool Building Board of the Sovnarkhoz pays little attention to the Yerevan Tools Plant and provides no assistance in mastering the production of the "USP," although that plant is the Bureau's experimental base for the production of tool production equipment. It is necessary to ensure the production of the planned number of "USP," thereby also making a major contribution to the improvement in the organization of production, perfection of technology, and acceleration of the production of up-to-date machines and machine tools.

To create a formidable tool building base, the Gosplan and Sovnarkhoz of Armenia should again return to the question of producing technological production equipment at the Tools Plant and providing assistance to that plant in obtaining new equipment. A rapid establishment of a tools base in our economic region will ensure the successful development of machine building in harmony with the planned targets.

9. New Automatic Lines

Following is the translation of an article entitled "Novyye Avtomaticheskiye Linii" (English version above) in Moskovskaya Pravda (Moscow Pravda), 19 February 1960, page 2.7

The "Krasnyy Proleteriy" Machine Tool Building Plant in Moscow has received a new automatic line, designed by the Experimental Scientific Research Institute of Metal-Cutting Machine Tools (ENIMS) and built by the "Stankokonstruktsiya" Plant. That line is designed for machining slotted shafts, which are widely used in machine tool building, automobile building, and other branches of industry. Upon readjustment, it can be used to handle as many as 13 different type-sizes of that part.

The machining of slotted shafts on the automatic line is much more convenient than by the conventional method. While the conventional, non-automated procedure requires for this purpose 22 machine tools operated by 14 workers, the automated procedure, on the line, requires only 11 machine tools whose operation is supervised by three workers. The standard design of the new line is being transmitted by the Institute for serial production to industry.

The assembling shop of the "Stankokonstruktsiya" Plant is at present completing the assembling of another automatic line designed by the ENIMS. This is a standard line for machining external-internal gears.

Each of the machine tools composing that line is equipped with an automatic magazine serving to halt it without halting the other machine tools. The line consists of lathes, pull-broaching machines, generating-type gear-cutting machines, and other machine tools, and it is designed for machining four types of gears. Its servicing requires not more than four persons per shift against the 20 persons needed for doing the same amount of work on separate machine tools.

A new automatic line is being designed for machining the shafts of electric motors. In contrast with the other lines of this kind that are already in operation at a number of the country's plants, this new line will have twice the productivity. This is because of the installation of additional machine tools operating in tandem in the sectors where the lengthiest operations are conducted. A great deal of work is being done by the ENIMS on the

designing of general-purpose loading-transporting devices. These devices will make it possible, upon using conventional serially manufactured machine tools, to automate the machining of various parts of the cylindrical-gear type and flanges.

All the new lines already designed or being designed at the ENIMS are based on standard and universal machine tools.

10. Rotor Lines and Their Friends and Foes

Following is the translation of an article by A. Yefimov entitled "Rotornyye Linii, Ikh Druz'ya i Nedrugi" (English version above) in Moskovskaya Pravda (Moscow Pravda), Moscow, 19 April 1960, page 2.

1. Who Opposes Them

Rotor machines, automatic rotor lines....By now there is no longer any doubt that the over-all mechanization and automation of our industry are being based on fundamentally new and progressive equipment and technology. Our industry owes this advance to a team of talented Soviet designers headed by L. N. Koshkin.

The work of the designers-innovators finds support among the leading industrialists. It is expected that 51 rotor lines will be installed in the enterprises in the environs of Moscow during the next three years.

The program of the Moscow City Sovnarkhoz is less ambitious. Here it is so far only a question of two rotor lines for the First Bearing Plant. A like number of lines is to be received by the Moscow Tube Plant. One line each will be built for the "Frezer" Milling Cutter Plant and the Krasnopresnenskiy Sugar Refinery. The Kerecharovskiyy Plastics Plant intends to introduce three rotor lines on its own initiative.

For sake of justice it should be stated that the Muscovites are beginning to "gather momentum," however slowly. The Sovnarkhoz intends to establish a design bureau and an experimental-industrial base for the design and introduction of rotor lines into industry. The momentum is increasing.

And yet there still exist forces thwarting the innovation....

This concerns the heads of the ENIMS [Experimental Scientific Research Institute of Metal-Cutting Machine Tools], which was appointed one of the main institutes for the design of automatic rotor lines!

Let us begin by mentioning that at every conference concerned with the problem of rotor lines the representatives of the ENIMS either voiced a general criticism of the trend adopted by Engineer L. N. Koshkin or demonstratively left the "field of battle," thereby emphasizing their disdain of this problem. This had happened, e. g.,

at the Scientific and Technical Conference on 16 June last year.

Later on, at the beginning of this year, in the course of a creative engineering and technical discussion on the fundamental trends in the designing of the 450 automatic lines subject to construction in the 1959-1965 period, the representatives of the ENIMS decided to make no comment. The head of the Division of Automation at the ENIMS Comrade Korsov had succeeded in diplomatically evading the controversial topic. But the Chief Designer at the ENIMS, Comrade Dikushin, who in his speech had also ignored rotor lines, still had to reply to a question inviting his opinion on these machines.

And Comrade Dikushin was forced to announce (restrainedly and equivocally) that rotor machines do indeed exist and that "some note should be taken of the more attractive aspects of this trend...."

On 17 February this year the Deputy Director for Scientific Research Work at the ENIMS, Comrade Vasil'yev, in his reply to the letter of the Moscow Oblast Board of the Scientific and Technical Society of the Machine Building Industry concerning a resolution of the Scientific and Technical Conference, had 'finally showed his cards,' as the saying goes.

2. A Frank Admission

"On the basis of considerable experience in the field of automation," Comrade Vasil'yev wrote without mincing his words, "the ENIMS is categorically opposed to the recommendations stated in Point 1 concerning the use of rotor lines...."

With a single stroke of the pen -- "categorically" -- Comrade Vasil'yev denied the expediency of using rotor lines in foundry operations, in the production of sheet stampings, for quality control of finished products, in galvanizing operations, in degreasing operations, paint coating, etc., etc. In a word, the vice director for research at a main institute has simply denied to rotor lines the right of existence, and that not only in the metal-working field but also in all other industrial fields.

Comrade Vasil'yev concluded his letter with the ominous admonition that: "The excessive attraction toward rotor lines may incur considerable material detrimental to the national economy and delay the process of the development of the automation of production processes in various branches of industry."

Could it be that Comrade Vasil'yev had expressed,

so to say, purely his own, unofficial opinion? No such thing -- it is a completely official and fundamental expression of the standpoint of the ENIMS. As soon afterward as on 18 March, at a session of the Section of the Technology of Machining and Assembling of the Central Board of the Scientific and Technical Society of the Machine Building Industry, the Director of the ENIMS Comrade Vladziyevskiy had figuratively demolished the rotor lines:

"Between us, machine tool builders, particularly the ENIMS," declared Comrade Vladziyevskiy, "and the Design Bureau a fundamental disagreement has been existing since the inception of that Bureau. We have assumed and continue to assume that the trend taken by Comrade Koshkin is technically absolutely irrational and causes enormous harm to the State."

To ultimately dethrone the rotor lines, Director Comrade Vasil'yev used a purely polemic approach:

"Comrade Koshkin," proposed Comrade Vladziyevskiy, "Take any part of a machine, and we will take the same part. We will make our own line, and you will make your own, rotor line. And then we'll see which line is better!"

3. Any Part? No!

But Comrade Koshkin did not accept this challenge; he refused to take "any part." He declared that first it is necessary to automate the most labor-consuming "technologically prepared" processes.

Where and in what branches of industry is it best to apply rotor lines as the means of automation? To this question Engineer Koshkin replied: primarily in the cold pressing and drop forging operations, and in the foundry, plastics, and ceramics industries, in powder metallurgy, in the rubber industry, in electrical and radio engineering, in instrument building, in hardware industry, and in other technologically matured branches of industry.

The use of rotor lines in the plastic products industry (in the volume planned for the end of the Seven-Year Plan) will relieve tens of thousands of workers, 30,000-40,000 square meters of production space, and it will yield over one and one-half million rubles of savings annually. As early as in the first year of their operation rotor lines will recoup more than twice the expenditures on their introduction -- they will pay off handsomely the expended investments. Rotor lines will increase labor productivity tens of times and save millions of tons of metal.

Then what about "any part"? Life itself answers

this question. The metalworking enterprises are successfully conducting useful work on the modernization of equipment, designing of automatic groups and lines based on the existing machine tools. Such an automation justifies itself. And it is to be assumed that any one who views rotor lines as the technology of tomorrow can also appreciate the entire importance of that necessary and arduous work on perfecting production which is being conducted on the basis of the existing technology. After all, extremes in solving any problem are always hazardous. Unfortunately, the heads of the ENIMS did not avoid this pitfall. And this harms the cause.

4. In Defense of Science

The Director of the ENIMS had expressed it clearly: a considerable and fundamental disagreement exists between him and Koshkin. Unfortunately, this disagreement often turns into mere squabbling.

In the heat of the discussion, Comrade Koshkin questioned the validity of the attitude of machine tool builders. He said that very sizable funds will be needed to design 450 automatic lines. These funds could finance a hundred new design bureaus similar to our own. Within a year's time these bureaus could provide industry with not less than two thousand types of rotor lines.

Announcements of this kind strongly affect the supporters of the attitude of the ENIMS. But this agitation does not in itself refute anything: there is a need for a penetrating economic analysis, for comparisons, figures, facts. And these are lacking. And so the dubious means of polemics are exercised:

"Your rotor lines perform poorly," gloat some.

"And how is your automatic plant making out?" counter others.

The partisans of the ENIMS are especially tickled by the "theory of the immaturity of technology." But in vain. The new technology is maturing, regardless of the resistance of those who cling to what is old. We can observe the victorious progress of the new technology in the fact that at the "Frezer" Milling Cutter Plant boring tools are obtained not by the method of "producing shavings" but by the method of plastic deformations. The new technology consists in powder metallurgy, investment-pattern casting, printed radio-engineering circuits. A little time will pass and the plastics laboratory at the First State Bearing Plant will discover a method of producing bearings from polymers. And then it will be possible to

state: technology has matured!

We do not intend to disparage the merits of the creative collective at the ENIMS, nor to claim monopoly for rotor lines in automation. It seems to us that the State Committee of the Council of Ministers USSR on Automation and Machine Building, and the institutes of the Academy of Sciences USSR, primarily the Institutes of Machine Science and Economics, should interfere in the controversy about these two trends. It is necessary to determine the place of rotor lines in the technological reequipping of industry, taking into account the new materials, new techniques, and new, improved organization of production.

It is in the interest of the cause that the Moscow City Sovnarkhoz should also act more energetically, and manifest greater initiative in the struggle for what is new and advanced.

11. Automatic Lines of a Higher Class

Following is the translation of an article by TASS Telegraph Agency entitled "Avtomati-cheskiye Linii Vysshego Klassa" (English version above) in Promyshlennno-Ekonomicheskaya Gazeta (Industrial and Economic Gazette), 31 July 1959, page 1.

A design bureau has devised the so-called automatic rotor lines. Their lengthy operation in plant shops has fully confirmed the calculations of designers. These lines proved to be very effective. They display a high productivity, operational reliability, and the related expenditures are quickly recouped.

The principal elements of these lines are the working and receiving-feeding rotors. Tools and the products to be machined are placed on continuously revolving working rotors which usually are of a cylindrical shape. Technological operations are conducted without halting the movement of the transported parts.

The receiving-feeding rotors are disk-shaped. Placed in between the working rotors, they also revolve continuously and ensure the feeding of parts for machining and the subsequent removal of machined parts while simultaneously carrying out the function of inter-operation transport of products. Thus a blank placed on the first working rotor begins to be machined and, without stopping anywhere, it is subsequently transmitted by the receiving-feeding rotors to the second, third, and subsequent working rotors -- until the line's end is reached.

At present the construction of an automatic rotor line for the "Karbolit" Plant near Moscow is being completed. It was calculated that the automation of the entire production of plastic products at that plant by means of such lines would increase the plant's industrial output 8-10 times without enlarging its production space, and moreover not one human being would then be directly occupied with the fabrication of products. The funds needed for this purpose are five or six times lower than the funds needed for increasing the plant's output to the same extent by installing conventional presses.

What then are the prospects of and possibilities for using rotor lines in industry? In reply to this question the head of that design bureau, Candidate of Engineering Sciences, Laureate of the Stalin Prize, L. N.

Koshkin, stated as follows:

"The over-all automation of technological processes in the most variegated branches of industry is one of our most important present-day tasks. This is usually solved by designing automatic lines. Such designing is often based on a technology substructured on the machining of products by cutting. The automatic lines themselves are formed by interconnecting by transport devices a group of the currently widely used continuous-action machines and machine tools. In such machines the blank is held immobile under or on the tool while being machined and, conversely, the tool idles during the transport of the blank toward the tool.

Such lines are imperfect. As a rule, it is impossible, e. g., to recoup within a short period of time the expenditures on the additional mechanisms and primarily on the inter-operation transport devices. The efficiency of the machines incorporated into such lines decreases abruptly, because the halting of one machine causes the immediate halting of all its companions. Lastly, such lines often consists of machines of a narrowly specialized purpose and are unsuitable for machining diverse types of products. Therefore the over-all automation of even a single branch of industry is a task that is difficult to materialize, because it is necessary to create an enormous number of lines. It is also understood that the technology in which preference is given to the machining of products by cutting is at present far from perfect.

All these complications and shortcomings cannot be completely eliminated by any design improvements of intermittent-action machinery. To overcome these complications it is necessary, in our opinion, to convert to another, more progressive technology -- rotor machinery, in which machining neither interrupts nor delays the transport movement of the product. It is precisely such machinery that should be regarded at present as the fundamental means of over-all automation of production. First designed in the Soviet Union, this machinery will greatly accelerate the pace of technological progress.

Automatic rotor lines can be used for any process, but they can find their greatest application on the basis of an advanced, higher-class technology, i. e., a technology at which blanks are machined by surface or volume action exerted by tools. For instance, rotor lines can ensure the over-all automation of foundry production, inclusive of investment-pattern casting and pressure casting, stamping and pressing operations, fabrication of products from plastics, radio-engineering parts, heat treatment and

chemical treatment, control and assembling operations, etc. The automobile, tractor, agricultural, and transport machine building industry, electrical engineering industry, instrument building industry, industry of means of communications -- all these are but a part of the branches of industry in which automatic rotor lines can be successfully applied.

The transition to rotor machines makes it possible to solve all the fundamental problems relating to the designing of economical and highly expedient automatic lines. Regardless of the duration of technological operations, these lines can be designed for any output rate, both for mass and for small-serial production. Consequently, it is possible to recoup within a short period of time the outlays on the inter-operation transport devices. The efficiency of such lines reached 90-95 percent. The tools mounted on them perform long and reliably, because then it is always possible to apply the most expedient technological mode of machining. The replacement of a tool can be conducted very quickly and, if necessary, automatically.

After these lines are used broadly for processes of the higher class, it will not be necessary to design each such line individually, because it is quite feasible to organize the serial production of the principal types of universal working and transporting rotors, and of auxiliary devices and attachments as well. The designing of a concrete line will then be reduced to the selection of the appropriate elements and accessories and to the installation operations themselves. When a line is converted to the fabrication of products of a new, technologically similar type, the principal task will consist in designing the necessary tools and preparing the appropriate working places on the rotors.

Automatic rotor lines ensure an improvement in all technical and economic indexes -- reduction of labor expenditures, reduction of production space, cost of equipment itself, consumption of tools, duration of production cycle, volume of uncompleted production, and percentage of rejects. The reduction of labor expenditures, in particular, is achieved as a result of the fact that in rotor lines it is feasible to conduct most thoroughly the automatic control of working operations and to utilize broadly the readings of that control for an active influencing of the course of the process for the purpose of preventing defective machining and protecting tools from premature breakdown.

A broad introduction of rotor lines into industry will ensure a speedier over-all mechanization and

automation of production processes. And this, as stated in the Resolution of the June Plenum of the CC CPSU, is the principal means of technological progress, without which a high tempo of further rise in labor productivity would be impossible.

12. What Prevents Us From Working Rhythmically?

Following is the translation of an article by V. Kochetkov, A. Il'in, M. Sharkov, and I. Ivanov entitled "Chto Nam Meshayet Rabotat' Ritmichno?" (English version above) in Moskovskaya Pravda (Moscow Pravda), Moscow, 19 February 1960, page 2.7

The "profile" of our machine tool production will change substantially during the seven-year period. Our Machine Tool Plant imeni Ordzhonikidze will become a large enterprise of the group machine tool building industry. Of the 1,300 automatic lines which are to be built during the seven-year period over one-fifth will be built by the Moscow machine tool plants.

To this should be added that in 1965 the output of group machine tools and automatic-line machine tools will double in comparison with 1958, and the output of automatic lines will nearly triple during the same period.

Having honorably fulfilled the 1959 plan, the crew of our plant has ardently tackled the materialization of the still more complex tasks of the second year of the Seven-Year Plan. And in this connection it is worthwhile to discuss a number of important problems affecting the normal, rhythmic operation of industry.

Let Us Speak of Blueprints

Working blueprints are the foundation for the material-technical backing of plans. They serve to determine the entire nomenclature of cast parts, steel sections, and accessories -- electric motors, bearings, electric and hydraulic parts and units, to be delivered by the enterprises of other branches of industry.

We lack any foundation for reproaching the Special Design Bureau No. 1 of the Moscow City Sovmarkhoz in connection with the insufficiency of working blueprints for automatic lines. Our plant has received all the necessary blueprints until the onset of this year. But since 1 January the Special Design Bureau has failed to furnish blueprints for over 200 group machine tools of unique design.

Two "6L24" automatic lines for the "Serp i Molot" Sickles and Hammer Plant in Seratov will be built according to blueprints of the Special Design Bureau No. 6

(Director -- Comrade Lyudmirskiy; Chief Engineer -- Comrade Volchek). These lines should be ready in July and August. However, that Bureau is in no hurry. Hitherto our Ordzhonikidze Plant still has received no information at all about the design of the related subassemblies, and hence also it does not know anything about the volume of needed metal and complementing products. Considering that the cycle of construction of one automatic line lasts approximately eight or nine months, it is easy to visualize the difficult position in which the Special Design Bureau No. 6 is placing machine tool builders.

This Should Be Remedied

Over ten percent of the total number of products composing machine tools and automatic lines consists of cast iron parts, delivered to us by foundries.

The total planned tonnage of deliveries by the "Stankolit" (our principal purveyor) was completely fulfilled. However, it is necessary to castigate the "Stankolit" for incomplete and unpunctual deliveries of specific castings -- in particular, parts for the group machine tools of individual design. Judge it yourselves: in the fourth quarter of last year the "Stankolit" failed to observe the deadlines for the installation of 22 group machine tools of unique design.

The fact that the "Stankolit" breaks the schedule is well known to the Sovnarkhoz's Machine Building Board. Every time this happens the workers of the Inter-Industry Cooperation Division of our plant turn to that Board for assistance. Then usually a hortatory telephoned telegram is sent, and, as a rule, it is "taken under advisement" by the "Stankolit."

It is now the third year in a row that funds for acquiring iron castings from the "Borets" Plant have been allocated to our plant. And it is the third year in a row that the heads of the "Borets" have fulfilled their duties poorly. Of the 400 tons of castings envisaged by the plan for last year from the "Borets" the amount actually received totaled ... 170 tons.

300 tons of castings were to have been given to us by the "Kompressor" Plant. And how much did it give? 59 tons! Thus, two Moscow enterprises failed to provide a total of 471 tons of castings to machine tool builders at the Ordzhonikidze Plant.

On Quotes and Standards

Our plant is a major consumer of rolled steel stock.

inclusive of structural and alloy steel grades. The Moscow City Sovnarkhoz and the Glavmetallobyt /Main Metals Marketing Board/ cannot be reproached for allocating metal unpunctually. But still, serious shortcomings exist in this matter too.

First of all, metal is allocated in large lots of a single type. The people at the Moscow City Sovnarkhoz and Glavmetallobyt usually refer to the fact that two large metals bases exist in Moscow. Incontestably, these bases are indeed large, but the variety of rolled stock, and particularly, tubes, needed by machine tool builders, is not available. In this connection, the planning organs should improve more quickly the organization of the supply of metals to Moscow's machine building plants. The question of the pertinency of modifying the so-called shipping quotas has more than once been raised on the pages of the press. For instance, our plant needs not more than one ton of a metal of a specific grade and shape. But the officially effective freight quota specifies from five to twenty tons of the same grade and size of metal. And such is the amount that we receive. What is the result? The unneeded surplus metal is wasting away unused at our plant.

The supply of the so-called fittings (cast parts for connecting tubes -- sleeves, angle irons, etc.) to the machine building industry is badly organized.

One more problem. It is very important that the Committee of Standards, Measures and Measuring Instruments under the Council of Ministers USSR should become fundamentally concerned with drafting unified, nation-wide standards for fastening fixtures for various branches of industry. Then it will become possible to organize specialized enterprises for the production of these fixtures and to relieve designers from the necessity of losing time on designing parts which should be governed by unified State standards.

The Plan Does Not Provide For This...

The plant's program includes the so-called "miscellaneous production" totaling the substantial sum of several million rubles. This pertains to tasks for the construction of various attachments, conductors, and other production equipment envisaged in the plans of cooperative deliveries. The tool and machine shops of our enterprise are fulfilling large orders placed with us by the "Mosstankoagrogat," the Special Machine Tool and Subassembly Plant, the "Kompressor," and other plants. But this is not enough: the Moscow City Sovnarkhoz has also introduced

the practice of extra-plan commissioning of equipment.

In the beginning of January the Chief Engineer of the Moscow Machine Building Board Comrade Berman decided that our plant should produce during the first quarter of the year 27 types of parts and original units for an automatic line for a plant in the environs of Moscow. And what has happened? The working blueprints for the parts and units of the projected line were issued to the plant by the "Orgstankinprom" Institute only as late as on 20 January. Moreover, the volume of operations has not been determined as yet. There are no castings, and no funds for metal have been assigned.

Many of the shops of the Plant (ent) Ordzhonikidze receive "mandatory" extra-plan orders from various enterprises which could themselves successfully cope with the problem. For instance, last year the First of May Plant had long delayed the production of needed attachments with its own resources, preferring to "pass the buck" to the men of the Ordzhonikidze Plant.

The matter would perhaps not have been worth mentioning had not the total volume of extra-plan orders exceeded 200,000 quota-hours. The execution of these orders would be tantamount to a full two-month work load on two machine shops!

* * *

We had dwelled on certain problems which disturb the machine tool builders. Our plant crew is resolutely determined to fulfill with honor its pledge to implement ahead of schedule the task for the second year of the Seven-Year Plan. However, the rhythmic performance of production depends not only on machine tool builders themselves but also on a number of extraneous factors. This should be food for thought to the Sovnarkhoz and the planning organs.

Investigating Team of the "Moskovskaya Pravda":

V. Kochetkov, Secretary of the Party Bureau of Plant Administration Divisions;

A. Il'in, Senior Engineer at the Division of Inter-Industry Cooperation;

M. Sharkov, Chairman of the Shop Committee of the Plant Administration Divisions;

I. Ivanov, Deputy Chief of the
Technical Supply Division

Plant imeni Ordzhonikidze

12. Tasks and Needs of Designers

Following is the translation of an article by V. Vasil'yev entitled "Zadachi i Nuzhdy Konstruktorov" (English version above) in Sovetskaya Belorussiya (Soviet Belorussia), Minsk, 23 March 1960, page 2.7

One of the principal tasks of the seven-year period is the further development of machine building, and primarily of its most important branch -- machine tool building. In this connection it is necessary to increase substantially the output of the newest types of special-purpose and group machine tools, machine tools with programmed control, automatic and semiautomatic machine tool lines, and forging-pressing equipment.

However, the presence of serious shortcomings in the work on the designing of new machines, instruments and other equipment, and shortcomings in the improvement of technology and organization of production as well, delays the pace of development of machine building in Belorussia.

What are these shortcomings?

As is known, at the July Plenum of the CC Communist Party of Belorussia the Vitebsk machine tool building plants imeni Kirov and imeni Komintern were subjected to a justly sharp criticism for fabricating low-productivity machine tools of superannuated design.

One of the reasons for this situation in these plants was the failure of their designer staff, because of its small size and low qualifications, to assure the plants technical documentation of good quality for not only new serial machine tools as replacements for the obsolete models but also the needs of current production. As a result, these plants have as a rule, for a number of years, been underfulfilling the plan of the output of new general- and special-purpose machine tools.

To eliminate the lag in designing work and to create a single and strong technological organ capable of solving the problems of the development of new technology, the SKB-13 /Special Design Bureau No. 13/ was established in Vitebsk on the basis of the design bureaus of three local machine tool building plants. The numerical extent of its staff for 1960 was stipulated at three hundred persons. According to the approved projects for specialization, the SKB-13 should conduct work on the designing of standard semiautomatic and automatic centerless-grinding

general-purpose machines and machine tools for incorporation into continuous-flow and automatic lines. In addition, we of the SKB-13 should devise designs of standard semi-automatic and automatic universal tool-grinding machines, automatic nut-cutting machines, and many others.

During the past period the SKB-13 had already devised with its own resources a number of new and original machine tool models that are greatly needed by the Nation's economy. Thus, it has developed the design of a centerless-grinding machine for machining tubes up to 150 mm in diameter and 10 meters in length, a semiautomatic ball-grinding machine, a special semiautomatic machine for grinding barrel-shaped rolls, and others. In this second year of the Seven-Year Plan the SKB-13 is confronted by even more complex and responsible tasks. The 1960 plan for the Plant imeni Kirov, e. g., envisages the designing of new models of machine tools for incorporation into automatic lines for machining valves, axles, gears, and other parts and, in addition, a number of new special-purpose machine tools. Altogether it will be necessary to design 29 new models for that plant. For the Tool-Grinding Machine Plant we of the SKB-13 will have to develop a complete continuous-flow line for machining carbon and copper-graphite brushes, and a gamut of tool-grinding and special-purpose machine tools, totaling 22 models. For the Plant imeni Komintern we expect to design 22 new models of automatic and semiautomatic special-purpose machine tools. In addition, in all these machine tool building plants, the laboratories of the SKB-13 should conduct large-scale work on the designing of new mechanisms and units of machine tools.

In order to solve these intricate tasks successfully, the Division of Technical Information has commenced gathering the necessary materials.

In our Socialist pledges for the seven-year period we provide for increasing the productivity of the new machine-tool models by 25-40 percent, and for saving ferrous and nonferrous metals to the extent of 4,500 tons or a total of nine million rubles.

Our Bureau is very young and, of course, its activities are not perfect as yet. One such imperfection, adversely affecting the course of production, is the presence of a number of errors in the blueprints for new machine tools, which we transmit to the plants. In this connection, these errors are generally not major and they are committed because of inattentiveness and negligence of designers. So much the worse. After all, such errors, although easily eliminable, lead at the same time to

considerable losses of materials and working time and cause the plants to submit justified claims to the SKB.

To avoid such errors in the future, we have organized advanced training courses for young specialists, and have established a more strict control of work.

But other matters also require discussion. The point is that the heretofore existing system of planning special-purpose machine tools for plants by the Soyuzglavmash [All-Union Main Administration of Machinery] under the Gosplan USSR also adversely affects the quality of design work and its completion on schedule.

Thus, the nomenclatural plan for special-purpose machine tools in 1959 for the Plant imeni Kirov was revised three times in the course of the year and ultimately approved as late as in August, i. e., in the second half of the year. As a result, the entire technical documentation for 10 types of machine tools, executed by the SKB according to the original plan before 1 August, was pigeonholed. The resulting nonproductive expenditures totaled approximately 113,000 rubles.

Moreover, the revisions of the plan often involve the inclusion of new machine tools, whose designing must consequently be conducted on a tight schedule and hence inevitably involves superfluous errors. Such a picture can also be observed in the other plants. The solving of this problem requires assistance from the Machine and Machine-Tool Building Board of the Sovnarkhoz Belorussian SSR.

To ensure normal conditions of work of the designers and the provision of good-quality technical documentation, it is necessary to establish such a sequence of planning as would ensure the drafting of documentation for plants approximately a year prior to the construction of the new machine tools.

We have additional difficulties. The SKB-13 has no accommodations of its own. In this connection, its designers are dispersed over the three afore-named plants, where they work in unsuitable and confined accommodations. All this adversely affects the quality of their work, and not infrequently it leads to failure to provide technical documentation on schedule. At present the UNR-37 of Trust No. 9 is erecting a building for the SKB. The Party organ the Sovnarkhoz Belorussian SSR, and the Ministry of Construction should provide assistance in obtaining materials for the most rapid possible completion of our building.

Longtime practical experience has shown that a high quality of design work and punctual provision of technical documentation of machine-tool models to plants are possible.

only in the presence of an experimental-testing base. At present the SKB maintains a small machine tool research laboratory which is capable only of conducting minor research projects and constructing uncomplicated mechanisms and subassemblies.

Life itself demands that the Sovnerkhoz should solve within the next year or two the problem of building an experimental shop in which it would be possible to construct experimental models of serial machine tools, conduct their comprehensive tests, revise subsequently technical documentation, and only then transmit that documentation to the plants.

In addition, it is also necessary to think of constructing some housing. After all, in 1959 of the eighteen young specialists sent to our SKB after graduation from the Belorussian Polytechnic Institute, six did not start work solely because of the lack of housing accommodations. At present, vacancies for division heads exist at the SKB. But it is impossible to attract to these positions skilled engineers from other cities of the republic, because we are unable to provide housing for them.

Despite the presence of certain shortcomings the Special Design Bureau in Vitebsk is a growing, industrious and resourceful organization, whose crew is equal to the complex tasks stipulated by the Seven-Year Plan.

14. Ways of Technological Improvement of Industry

Following is the translation of an article by A. Prokopovich entitled "Puti Tekhnicheskogo Sovershenstvovaniya Proizvodstva" (English version above) in Krasnaya Zvezda (Red Star), Moscow, 23 March 1960, pages 2-3.⁷

Problems of the Theory and Practice of the Building of Communism

"It is necessary to introduce more machines universally, to switch to the use of machine technology as broadly as possible.

"V. I. Lenin."

The Soviet nation is fulfilling the historic resolutions of the 21st CPSU Congress with unprecedented energy. In 1960, the second year of the Seven-Year Plan, the struggle for accelerating technological progress, for improving production in all ways, is unfolding still more broadly. This is the cardinal factor in the creation of the material-technical base of communism. Under present-day conditions, in this age of the atom, electronics, chemistry, and "spatniks," victory will be yielded by pace-setting science and advanced technology, which unlock boundless prospects for the rise in labor productivity.

What then are the ways of the technological improvement of Socialist industry? How does the "rejuvenation" of technology promote the rise in labor productivity and the attainment of the maximum volume of output in minimum time and with minimum expenditures, and how does it assist in a successful and pre-term fulfillment of the targets of the Seven-Year Plan?

The Physical and "Moral" Wear of Equipment

In the struggle for technological progress it is particularly important to produce improved means of production that are on the level of the most recent advances of science and technology -- machine tools, machinery, mechanisms, instruments. The technological level of the equipment existing in factories and plants, on construction sites, and in agriculture, determines labor productivity and the quality and cost of production over a long period

of time.

Approximately two million various machine tools exist in our country. Are they all equally commensurate with the most recently attained level of technological development and with the contemporary requirements of production technology? No. After all, machinery and machine tools "grow old" like everything else in the world. In some machines the most important units and parts become worn or break down as a result of prolonged work. And the machine "grows old"; it has served its time, it has become, so to speak, physically worn, and it needs a major overhauling or replacement by a new machine. Nonetheless, other machines and machine tools have been used comparatively rarely and, at first glance, they seem fit for further operation. But the crews of enterprises and the planning organs file requests for replacing them by newer, better ones. Why? It is found that these machines have also "aged," except that their "obsolescence" is not of the physical but of another kind. The operating possibilities of such machines have ceased to be commensurate with the level of contemporary technology, and the so-called moral wear has taken place. The operation of such machines has become economically less effective than that of other, more modern and improved equipment.

True, when devising certain types of machines -- mainly the general-purpose ones -- designers provide for a definite margin for future rise in productivity along the anticipated trends of technological development. For instance, in the new models of metal-cutting machine tools the range of speeds and sometimes also of capacities is considerably greater than that currently used in industry. But the more rapid the improvements in technology, and in methods of production, the more rapid the exhaustion of the potential possibilities for increasing productivity "built in" in the machine during its designing.

Other factors aside, it may be stated that a continual modernization of machines, machine tools, mechanisms, instruments, and techniques is desirable for ensuring the development of production technology on the maximum level. It is not accidental that the technological level of any given branch of industry is evaluated primarily according to the age of its basic technological equipment.

To solve successfully the practical tasks of the advanced building of communism, the Party has outlined and is materializing a concrete program of further technological progress, of another qualitative upsurge in the technological level of industry. This program is based on the transition to the over-all mechanization and automation of

production processes in all branches of the national economy, modernization of existing enterprises, renovation and replacement of obsolete equipment, and improvement of the technological processes of production.

To assure industry a continuous supply of up-to-date equipment designed on taking into account the latest achievements of science and technology and the pace-setting operational experience, the Party and State expect the workers of the machine building industry to display a still greater persistence, energy, and initiative in improving designs of the manufactured machines, attainment of longer service life of machines, and timely replacement of the obsolete models by new ones.

It Is Quality That Matters Most In The Replacement of Machines

To achieve technological progress, create the material-technical base of communism, and elevate all branches of our national economy to a new and hitherto unprecedented height, it is primarily necessary, as noted previously, to develop in all ways the machine building industry. It is not accidental that machine building is called the core of heavy industry, the basis of bases for the development of the national economy as a whole.

The Seven-Year Plan envisages an approximately twofold increase in the output of the machine building and metalworking industries. A high pace of development will characterize heavy machine building, instrument building, radio electronics, electrical engineering industry, and machine tool building. Over a million metal-cutting machine tools will be built during the seven-year period. The machine tool pool of the Soviet Union in 1965 will climb to 2,500,000 items (the machine tool pool of the United States in 1958 totaled 2,200,000 items). The number of forging-pressing machines will increase to a total of 450,000. This will make it possible to expand considerably the productive capacities of the Soviet Union.

The increase in the machine tool pool will be accompanied by a substantial "rejuvenation." What are the principal ways of "rejuvenating" equipment. They consist in, first, the replacement of the physically obsolete equipment by new machinery and machine tools, and, second, the modernization of the existing designs of machinery and machine tools, the introduction of improvements yielding a considerable technological and economic gain, and lastly, the industrial introduction of qualitatively new, most progressive models of technological equipment designed on

the basis of the latest achievements and discoveries of science and engineering and serving to multiply productivity compared with the previous machinery and machine tools.

During the seven-year period over 600,000 machine tools or about 30 percent of the entire existing pool will be replaced in our country. The greater part of the new machine tools will be allocated to the machine building industry, where over one-half of the machine tool pool is expected to be replaced. Thanks to the materialization of this program in 1965 over 60 percent of the entire machine tool pool of the Soviet Union will consist of machine tools below 10 years of age. In the United States, despite the large-scale discontinuation of the production of obsolete machine tools in recent years, the number of machine tools below 10 years of age accounted for only 40 percent of the total pool in 1958. Thus, the indigenous Soviet pool of metal-cutting machine tools, which by now also is already much younger than that of the United States, will become in 1965 not only the world's largest but also the world's youngest. The technological re-equipping of the other fields of industry too will be conducted on approximately the same scale.

The plan of development of the national economy of the USSR in 1960 anticipates the reaching of new frontiers in the development and technological improvement of all branches of Socialist industry. The production of over 500 obsolete equipment types will be discontinued, and supplanted by the serial production of approximately 400 new principal types of machinery and machine tools, and in addition over 1,400 experimental models of machines, mechanisms and devices will be developed and built.

Understandably, the important thing about the replacement of equipment is not the quantity but the quality of the industrially introduced new machines and machine tools. This is demonstrated by a simple calculation. Thus, it is known that the new metal-cutting machine tools are 20-25 percent more productive than the old ones. Assuming that the entire existing pool of such machine tools owned by the machine building industry is replaced by analogous new machine tools, labor productivity in the machine shops of enterprises will rise 20-25 percent. But the Seven-Year Plan envisages a rise of 45-50 percent in labor productivity in industry, and hence also in machine building, during the 1959-1965 period; and, taking into account the shortening of the working day, this rise ought to be even higher.

To implement this grandiose target successfully, it is necessary to provide industry with such new equipment

as would make it possible to double and triple labor productivity compared with the present level. As shown by experience, this task is solved most effectively by providing industry with automated equipment. Thus, if in machine building an existing general-purpose machine tool is replaced with a new, but automated one, labor productivity per worker will increase not 20-25 percent as in the preceding case but at least threefold. This signifies that the replacement of a single general-purpose machine tool by an automated one is, from the standpoint of a rise in labor productivity, equivalent to the replacement of 12-15 old machine tools of this kind by a like number of new models.

It is not difficult to conceive the enormous economic benefits of this innovation. The "Serp i Molot" Hammer and Sickle Plant in Khar'kov, o. g., operates an automatic line for machining the head of the engine block of a coal cutter-loader. This has resulted in quadrupling the output of these parts per worker. At the Moscow Hard Alloys Combine, in the first department of one of its shops, automatic machinery has freed about one-third of the production space and doubled the output. The total automation of the First State Bearing Plant will result in increasing its output capacity by 75 percent.

A high degree of mechanization and automation is a characteristic feature of all the new machines and equipment subject to fabrication during the present seven-year period. During that period, machine tool builders will construct over 150,000 automated machine tools and not less than 1,300 automatic lines. In 1965 nearly every fifth machine tool built by the machine building enterprises will be an automated one.

Within the next few years, over-all mechanization and automation will be carried out in 27 of the enterprises existing in Moscow, including the Automobile Plant (Imeni Likhachev), the First State Bearing Plant, and the "Parizhskaya Kommuna" Factory, and in 139 shops and departments of other Moscow enterprises as well. Plans exist for installing 1,560 mechanized continuous-flow and conveyor lines, and over 14,000 new automatic, group, and special-purpose machine tools.

The automation of production in industry promises to yield enormous economic benefits. Over one-half of the rise in labor productivity envisaged for the seven-year period should be attained as a result of the automation of production processes. In practice this signifies that the seven-year period will be a period of the technological re-equipping of all branches of the national economy, in which connection in many cases this re-equipping will be in

the nature of a veritable technological revolution.

The Advantages of the Modernization of Equipment

The 21st Party Congress and the June (1959) Plenum of the CC CPSU emphasized the great national-economic importance of the modernization of existing equipment to a successful fulfillment of the tasks of the Seven-Year Plan. This path will make it possible to expand productive capacities in a shorter time and with minimal expenditures of material and financial means compared with the construction of new equipment, and thereby to increase industrial output considerably.

Of special importance will be the modernization of equipment in heavy machine building, metallurgical, ore-mining, and chemical industries. Calculations show that during the seven-year period it will be necessary and possible to modernize approximately 500,000 metal-cutting machine tools. The realization of this program will yield savings of over three billion rubles in machine building. Similar benefits will be yielded by the modernization of existing equipment in the other branches of industry.

Improvements in technology and equipment will ensure the maximally complete utilization of raw materials and semifinished products -- the principal factors in cutting production cost. This is of great importance to machine building, where annually over 4.5 million tons of metal are lost in the form of shavings and chips. The experience of the pace-setting enterprises reveals the feasibility of a substantial reduction of such losses of metal through the improvement of technological processes and modernization of equipment.

Modernization yields its greatest economic effect when based on a comprehensive solving of the tasks of raising the technical level of production, and primarily on a maximal elevation of the level of the mechanization and automation of equipment. Altogether during the seven-year period about a million units of technological equipment will be modernized. The conduct of the planned overall modernization of equipment in industry will enable the State to save many billions of rubles during the seven-year period.

An important example of the concrete fulfillment of the directives of the 21st Party Congress and June Plenum of the CC CPSU is the valuable initiative displayed at the beginning of this year by the crew of the Novo-Krematorsk Machine Building Plant imeni Stalin. The Novo-Kramatorsk

men pledged themselves to draft technical designs with their own resources and to build in excess of the established plan over three thousand tons of equipment for the modernization of the existing rolling mills, steel-teeming cranes, walking excavators, and other large machines and mechanisms previously delivered by that plant to metallurgical and other industrial enterprises. The modernization of two rolling mills alone, at the "Zaporozhstal" and Zhdanov "Imeni Il'ich" steel plants, will make it possible to increase the production of rolled metal stock by one and one-half million tons a year and to save over 130 million rubles compared with the outlays that would otherwise have been needed for new facilities.

In a special resolution the Central Committee of the CPSU has praised the patriotic initiative of the workers of the Novo-Krematorsk Plant and recommended widespread emulation of their deed and broad development of Socialist labor competition for the most rapid possible conduct of the modernization of existing equipment. Following the remarkable example given by the Novo-Krematorsk man, an ever-increasing number of machine building, machine tool building and other enterprises and scientific research and project-design organizations in the country is joining the competition for increasing output capacities, accelerating technological progress, and expanding industrial output with minimal expenditures.

The struggle of the Soviet people for technological progress is not only of economic importance but also of enormous social significance. Under the conditions of capitalism, as is known, technology and the worker are at loggerheads, and technological progress entails intensified exploitation of the worker and growth in unemployment and poverty. In a socialist society, on the other hand, the technological improvement of production is done for the good of man, in the name of promoting the welfare of the people, multiplying its material and spiritual riches. It facilitates and radically alters the character of the work of millions of people, increases the productivity of that work, and creates the conditions for shortening the long working day -- thereby eliminating the great discrepancies between mental and physical work. This inspires the Soviet people toward new successes in the struggle for technological progress.

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The continual improvement of Socialist production and the most rapid possible introduction of new technology

in all branches of the national economy intensify the economic potential of the Soviet State, consolidate its defensive might, and hasten our progress toward communism.

15. Eliminate Amateurish Methods. Block the Path for Rejects

Following is the translation of an article entitled "Pokonchit' s Kustarsshchinoy, Pregredit' Dorogu Braku" (English version above) in Vechernyy Leningrad (Evening Leningrad), Leningrad, 4 March 1960, page 2.

An investigating team of worker newspaper correspondents was organized also at such a large enterprise of the Vyborgskiy Rayon as the Machine Tool Building Plant imeni Il'ich. What was observed and discovered by the members of the investigating team within the period of a few days?

Why Did the Plant Disrupt Its Plan

The output program for last year was successfully completed by the plant's crew, which has produced additional output in excess of the plan, to the value of hundreds of thousands of rubles. But these were only appearances which veiled shortcomings in the performance of the plant. These shortcomings are sizable: the loss because of rejects in 1959 totaled 262,000 rubles, and 21 claims were received.

This year the plant has converted to the production of the latest precision grinding machines with a high class of accuracy. However, the plant proved to be unprepared for this. The January program of gross output was underfulfilled. The country's machine builders were provided with nine machine tools less than expected. And in February the plant furnished only three machines on the account of the January program.

As before, the losses because of rejects continue to be high at the plant, reaching many thousands of rubles.

The primary responsibility for this is, of course, borne by the plant's heads. The poor preparation of the leading departments and shops for the production of new precision machine tools results in the rise of major difficulties during the production process -- difficulties which the plant's heads could not surmount; these are the reasons for the disruption of the plan. The plant's crew was not properly mobilized for implementing the new, greater and more complex production tasks.

The General Machine Building Administration of the Leningrad Sovnarkhoz and the Vyborg Rayon Committee of the

CPSU have been informed about the state of affairs at this plant. They have repeatedly adopted correct decisions about reconstructing the plant, improving the supply of designer cadres to the plant, furnishing the plant with new equipment and perfected control and measuring devices, combatting rejects, and so on. But there was no control of the implementation of these decisions.

The plant's Party organization established a commission for struggling against rejects, headed by the experienced production man and Party member Comrade Kuznetsov. However, the commission is not sufficiently active, and its head had even excused himself from participating in our investigatory team. And so it came to pass that numerous and correct decisions were made but their benefits proved to be few.

Who Then is Making Rejects

The participants in the investigating team discovered that 7,200 rubles worth of various parts were rejected as defective in Machine Shop No. 2 during January. In February the output of rejectable products did not decrease. And yet the shop's head, Comrade Gerasimov, excuses himself by referring to the lack of skilled workers. But this, of course, is not the sole explanation. In that shop, cases of rejects made by skilled workers also are not infrequent. Thus, the skilled turner, Comrade Fadeyev, spoiled a lot of bushings because of carelessness. On 15 February, while machining axles, the young turner, Comrade Bashkankov, used the wrong clamp for measuring parts, because of inexperience. He made 30 axles, and they were defective. But neither the shift foreman, Comrade Astakhov, nor the head of the quality control department at the shop, Comrade Blatova, had noticed this error in time. The quality control inspectors should have inspected the first part made by that worker. And if that part had proved acceptable, it could have served as the model for the worker. But neither Comrade Blatova nor the other workers at the quality control department had done so, and the query by the investigating team elicited the following unusually strange reply:

"We, the quality control inspectors, have not the time to attend to every individual part."

The Machine Shop No. 1 has just as sorry a record with regard to rejects. But its heads attribute this to "objective" reasons of another nature: bad, worn equipment. But how come? On 17 February Quality Control Inspector Comrade Zasukhina received a set of levers for the L331

machine tool, for inspection. The levers were executed with deviations from blueprints and technical requirements. But instead of rejecting them and naming the real culprits responsible for the production of substandard products, the inspector named as the culprit... the Plant (Imeni Sverdlov, which delivers castings here.

In general, attempts to blame its own shortcomings on others are frequent phenomena at the plant.

You Cannot Hide Flaws During Assembling

Over 1,500 312M type machine tools have been manufactured by the plant. It would seem that the plant should already operate with a well-elaborated technical documentation. But this is not true in practice. On 15 February the Assembling Shop No. 1 received parts and subassemblies of machine tools of this type, in which the Quality Control Foreman Comrade Valdimirov detected 58 (!) different defects. Why?

Finally one-half of the defects in the unfortunate machine tool was eliminated. On 17 February it was again presented for inspection, but even so it was not completely ready.

To avoid stoppages, the fitters-assemblers often conduct, together with the machine tool builders from the machine shops, various manipulations such as the undercutting and readjustment of parts, without advising the foremen, designers and technologists about them. Such a style of work inevitably leads to deviations from the dimensions specified in blueprints, and from technical requirements, and hence it leads to rejects.

Has it taught the assemblers a lesson? No.

On 18 February the workers of that shop, comrades Bochkarev, Bondarev and Fervushchev, manipulated the parts of the 2A1532 machine tool in this manner. As a result of such manipulations, one of the parts, the body of the chuck ultimately proved to be defective.

Comrade Yefimov, a member of the investigating team, stated in a letter that the cones, frames, gear bodies, and a number of other parts of 3P95, LZ-31, LZ-73 machine tools, readied for assembling at the time of the investigations, displayed a number of various defects.

Elevate the Level of Production

It would seem that the plants producing high-precision machine tools should maintain special cleanliness and order. But no such thing has happened here. The

Machine Shop No. 1 is filthy, and its passages are blocked by autocars, and piles of machine parts, and are strewn with metal chips.

The Machine Shop No. 2 is somewhat cleaner and less obstructed. But here also a strange sensation of an amateurish style of work makes itself felt. For instance, the group of grinding machine tools has not been provided with a piped-in supply of cooling water, and there are no drains for dirty water.

An ideal cleanliness should exist in the assembling shops. These shops deal with parts machined to a precision of two microns. But actually the roof is leaking, and water soaks blueprints and machine tools. It drips onto electric motors and machine-tool parts, which are piled helter-skelter in these shops. Also not spared were the units of feeding mechanisms, which should be stored and positioned accurately and under no circumstances, piled up.

The transport of parts and units from the galvanic shop and other shops is conducted not in special containers but in piles. This causes breakage -- another source of rejects!

The head of the Quality Control Division at the plant, Comrade Geller, has drafted a plan of organizational and technical measures against rejects. The plan was twice subjected to revision and finally readied.

The members of the investigating team looked into the implementation of that plan, and they found that it is still lying in a drawer in Comrade Geller's desk, although the deadlines for the execution of certain of its points have already passed.

The members of the investigating team brought all the detected defects to the attention of the Chief Engineer Comrade Kargin, but to every remark he imperturbably replied that "these are not typical facts." How much "not typical," Comrade Kargin?

It is necessary to look around once more with an attentive "owner's" eye, to cease to ignore remarks, and to remedy the shortcomings. This is demanded by the interest of the cause. This is demanded by the honor of the plant's name.

16. An Inept Performance

Following is the translation of an excerpt from an untitled article.⁷

...Two years ago when many of the blueprints of the "5240" machine had not yet even left the walls of the SKB-5 /Special Design Bureau No. 5/, the Bureau's head Comrade Pronin .../illegible/ the future colossal savings from the introduction of the semiautomatic gear-cutting machine, hastened to present in advance the Gear-Planing Machine Plant with a bill for bonuses. Now the same Comrade Pronin has nothing but bad words for that Plant; he no longer mentions any bonuses and he even denies his brainchild. Heated words were exchanged between designers and the Plant's workers for several days, and during all that time the semiautomatic gear-cutting machine lay in solitude, like a foundling, at the door of the laboratory.

And inquiries flooded Saratov: when will the machine be ready?

The Plant's Director L. Fed'yashin was finally compelled to end this game of silence and, with sorrow in his voice, to ask for a truce.

"Reject the order for the delivery of the machine. After all it is an experimental model and it has many design shortcomings!"

But the customers could not be moved by sentiment. They continued to demand the delivery of the machine. Last October the Soyuzglavmesh /All-Union Main Administration of Machinery/ under the Gosplan USSR sent a letter stating that, "according to the communication of the Director of the Gear-Planing Machine Plant, the model "5240" machine produced at that Plant cannot be released to customers. The Plant's motive seems very strange, to say the least. If the machine really has such great shortcomings as to be useless for the purpose for which it was designed, how then can it be considered 'produced'? There exists no foundation for rejecting the order placed for it."

The letter of the Soyuzglavmesh caused a stir in the Sovnarkhoz. An ordinance was issued that by 15 December 1959 all the shortcomings in the production at the Plant should be eliminated, but this time as well no word was said about the design shortcomings -- although it is these that should have been mentioned.

In its assembled form the automatic gear-cutting

machine presents a rather strange appearance, because many units seem, as it were, to hang suspended from the frame rather than to lie within it. The hinges, locks and other fastening fixtures are executed differently: some are round, others rectangular, and still others rounded at top. Everything shows that the designers ignored the unification of parts and were totally unconcerned about the "architecture" of the machine. They had also failed to think about other important matters. The blueprints of the machine were sent by the SKB to the Plant without prior verification. In the course of the construction, 718 modifications were introduced in the design, but many of the major defects could not as yet be eliminated. Industrialists correctly point to the extreme "untechnologicality" of the assembling of this semiautomatic machine.

Recently we have again seen the "5240" machine -- in the laboratory of the SKB-5. More exactly, this was not a machine but only a pitiful shape of one. A rack, a carriage, and an electric cabinet with a broken-down lid rested on the frame of the semiautomatic gear-cutting machine. The other units were dismantled. The dismantling revealed disturbing facts /rest of paragraph missing/.

...What then were the conclusions deduced from this sad occurrence in the Saratovskiy Sovnarkhoz?

The other day a schedule for the construction of that machine was drafted there. But what about the people who displayed such criminal negligence -- how were they treated? They were left unscathed! The reject-makers went unpunished.

The Saratov machine builders recall what happened a few years ago, when because of the negligence of the same designers and constructors, two other machine tool models had to be rejected. As can be seen, nothing was learned from mistakes made in the past. The liberal attitude of the Sovnarkhoz in the case described here makes us strongly doubt that such phenomena will not again take place in Saratov.

END